

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1-8. (Cancelled)

9. (New) An improved device for measuring physical characteristics of a porous solid sample by performing successive drainage and imbibition phases, in the presence of a first electrically-conducting fluid and of a second fluid of lower density than the first fluid comprising:

rotatable mobile equipment including at least one elongate vessel provided with an inner cavity for the sample, the at least one vessel being fastened to an end of an arm secured to a fulcrum pin and associated with means for balancing, means for driving the arm in rotation for creating a centrifugal force exerted along a direction of elongation of the at least one vessel, a system for displacing at least the second fluid of lower density, and means for detecting an interface position of the fluids in the at least one vessel comprises a capacitive sonde placed in the at least one vessel along a direction of elongation thereof, for continuously detecting displacement of the interface between the two fluids in the at least one vessel, and the means for detecting an interface position of the fluids in the at least one vessel being externally connected to a measuring device through a rotatable connector.

10. (New) A device as claimed in claim 9, wherein the capacitive sonde comprises a metallic rod coated with a layer of a dielectric material and connected to means for measuring the capacitance variation of the sonde in contact with the fluids in the at least one vessel resulting from the immersion thereof in the conducting fluid.

11. (New) A device as claimed in claim 9, comprising a system for controlling at least transfer of one of the fluids in the at least one vessel to maintain the interface between the two fluids at a determined level in the at least one vessel .

12. (New) A device as claimed in claim 10, comprising a system for controlling transfer of at least one of the fluids in the at least one vessel to maintain the interface between the two fluids at a determined level in the at least one vessel .

13. (New) A device as claimed in claim 9, wherein the system is stationary and is connected to the at least one vessel by the rotatable connector including a sealed rotating electro-hydraulic connector, hydraulic lines and an electrical link and includes a pump for the fluid having the lower density, a tank for collecting at least part of the fluid expelled from the sample and a programmed micro-computer for acquiring signals from a means for measuring and controlling transfer of the fluids, to maintain the interface between the two fluids at a constant level during operation.

14. (New) A device as claimed in claim 10, wherein the system is stationary and is connected to the at least one vessel by the rotatable connector including a sealed rotating electro-hydraulic connector, hydraulic lines and an electrical link and includes a pump for the fluid having the lower density, a tank for collecting at least part of the fluid expelled from the sample and a programmed micro-computer for acquiring signals from a means for measuring and controlling transfer of the fluids, to maintain the interface between the two fluids at a constant level during operation.

15. (New) A device as claimed in claim 9, wherein the rotatable connector includes sealed hydraulic channels including a first channel for connection to a hydraulic system and a tank for collecting at least part of the fluid expelled from the sample and connected to the at least one vessel by a second channel of the rotatable connector.

16. (New) A device as claimed in claim 10, wherein the rotatable connector includes sealed hydraulic channels including a first channel for connection to a hydraulic system and a tank for collecting at least part of the fluid expelled from the sample and connected to the at least one vessel by a second channel of the rotatable connector.

17. (New) A device as claimed in claim 11, wherein the rotatable connector includes sealed hydraulic channels including a first channel for connection to a hydraulic system and a tank for collecting at least part of the fluid expelled from the sample and connected to the at least one vessel by a second channel of the rotatable connector.

18. (New) A device as claimed in claim 12, wherein the rotatable connector includes sealed hydraulic channels including a first channel for connection to a hydraulic system and a tank for collecting at least part of the fluid expelled from the sample and connected to the at least one vessel by a second channel of the rotatable connector.

19. (New) A device as claimed in claim 13, wherein the rotatable connector includes sealed hydraulic channels including a first channel for connection to a hydraulic system and a tank for collecting at least part of the fluid expelled from the sample and connected to the at least one vessel by a second channel of the rotatable connector.

20. (New) A device as claimed in claim 9, comprising a rotating electro-hydraulic connector provided with at least one sealed hydraulic channel connected to the hydraulic system and a tank for collecting at least part of the fluid expelled from the sample which is secured to mobile equipment.

21. (New) A device as claimed in claim 10, comprising a rotating electro-hydraulic connector provided with at least one sealed hydraulic channel connected to the hydraulic system and a tank for collecting at least part of the fluid expelled from the sample which is secured to mobile equipment.

22. (New) A device as claimed in claim 11, comprising a rotating electro-hydraulic connector provided with at least one sealed hydraulic channel connected to the hydraulic system and a tank for collecting at least part of the fluid expelled from the sample which is secured to mobile equipment.

23. (New) A device as claimed in claim 12, comprising a rotating electro-hydraulic connector provided with at least one sealed hydraulic channel connected to the hydraulic system and a tank for collecting at least part of the fluid expelled from the sample which is secured to mobile equipment.

24. (New) A device as claimed in claim 9, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

25. (New) A device as claimed in claim 10, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

26. (New) A device as claimed in claim 11, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

27. (New) A device as claimed in claim 12, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

28. (New) A device as claimed in claim 13, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

29. (New) A device as claimed in claim 14, wherein the rotatable connector is a rotating electro-hydraulic connector with sealed hydraulic channels communicating the hydraulic system, the at least one vessel is arranged symmetrically relative to the rotatable mobile equipment and is driven in rotation by the means for driving.

30. (New) A device as claimed in claim 9, comprising a measuring and control system for controlling at least one fluid transfer to maintain the interface between the fluids at a determined level in the at least one vessel including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

31. (New) A device as claimed in claim 10, comprising a measuring and control system for controlling at least one fluid transfer to maintain the interface between the fluids at a determined level in the at least one vessel including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

32. (New) A device as claimed in claim 11, comprising a measuring and control system for controlling at least one fluid transfer to maintain the interface between the fluids at a determined level in the at least one vessel including means

for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

33. (New) A device as claimed in claim 12, comprising a measuring and control system for controlling at least one fluid transfer to maintain the interface between the fluids at a determined level in the at least one vessel including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

34. (New) A device as claimed in claim 9, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

35. (New) A device as claimed in claim 10, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

36. (New) A device as claimed in claim 11, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.



37. (New) A device as claimed in claim 12, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

38. (New) A device as claimed in claim 13, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.

39. (New) A device as claimed in claim 14, including means for determining physical parameters of the sample by accounting for amounts of the fluids displaced during operation.